FAA GENERAL AVIATION NEWS

APRIL 1977

A FLIGHT STANDARDS SAFETY PUBLICATION FOR AIRMEN

Gentle on the ground

GENERAL AVIATION NEWS

A FLIGHT STANDARDS SAFETY PUBLICATION FOR AIRMEN

FAA

GENERAL AVIATION NEWS

DEPARTMENT OF TRANSPORTATION/FEDERAL AVIATION ADMINISTRATION VOL. 15, NO. 12

COVER:
Orange County Airport,
Central Virginia

CONTENTS/April 1977

3 Restless Runways

7 Status of FARs

8 The Engine Doctor: Magneto Magic

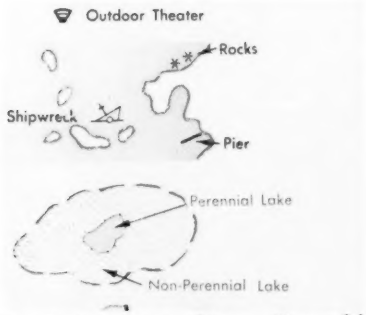
11 Chart Symbols

12 Famous Flyers: Curtis Pitts and the Little Bipe That Bit Its Own Tail

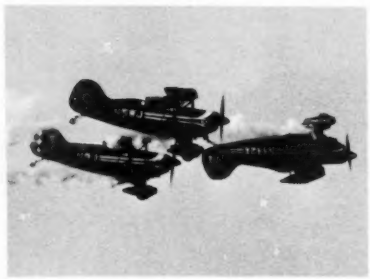
13 Briefs

14 News: Aviation Review Meeting Delayed . . . TERPS Available From GPO . . . Nominations Sought for Annual Instructor and Mechanic Awards . . . Aircraft Type Data Sheets Now Offered in Six Volumes . . . Tips on Extending Tire Life

15 Flight Forum



Symbolically speaking Page 11



Odd man out Page 12

Brock Adams, *Secretary of Transportation*
Dr. John L. McLucas, *Administrator, FAA*
R. P. Skully, *Director, Flight Standards Service*
Bernard A. Geier, *Chief, General Aviation Division*

David Gelfan, *Editor*
Ruth Taksel Benedict, *Associate Editor*
Louise Oertly, *Assistant Editor*

FAA GENERAL AVIATION NEWS is published by Flight Standards Service, Federal Aviation Administration, Department of Transportation, Washington, D.C. 20591, in the interest of flight safety. The magazine is designed to promote safety in the air by calling the attention of general aviation airmen to current technical, regulatory and procedural matters affecting the safe operation of aircraft. The use of funds for printing FAA GENERAL AVIATION NEWS was approved by the Director of the Office of Management and Budget on July 30, 1974. All printed materials contained herein are advisory or informational in nature and should not be construed as having regulatory effect. The FAA does not officially endorse any goods, services, materials or products of manufacturers that may be mentioned.

SUBSCRIPTION SERVICES

FAA GENERAL AVIATION NEWS is sold on subscription at $6.20 per year (individual copies, 55 cents) by the Superintendent of Documents, Government Printing Office, Washington, D.C. 20402. Use the self-mailer order form in the centerfold of this magazine to subscribe. Prices are subject to change without prior notice.

Please anticipate one to two months for processing orders. Subscriptions are for one year only, and only one renewal notice is sent. Act promptly to avoid lapse of subscription.

Subscription problems. Contact the Service Section, SSOS, GPO, Washington, D.C. 20402.

Change of subscribers address. Send both old and new address to MAIL LIST SECTION, GPO, Washington, D.C. 20402.

Restless Runways

The flying farmer from Dubuque, Iowa, made three passes over the small suburban airport before entering the pattern. His Cessna 170 had been gathering dust in the barn over the winter, and he knew he was a little rusty at the controls. He explained that he wanted to see just how the wind was blowing, what kind of pattern the airplanes were landing with, and how they were taking off. His wife, in the seat beside him, relaxed when he finally turned on final at 300 feet above the ground, and his two small sons, in the back seat of the aircraft, had their noses pressed against the side windows. Touchdown was smooth enough, and right at the threshold, but what followed was a disheartening thump as the right wheel hit a waterfilled pothole and nearly slewed the aircraft around. The pilot managed to dodge his way past additional potholes with which the runway seemed liberally sprinkled as he rolled out, but his attention was distracted momentarily (as his younger son lost his breakfast) and he failed to notice a soggy crevice in the asphalt where he turned onto the taxiway. The crevice pulled the aircraft into a ditch and stopped it abruptly, nearly wrenching off the landing gear. His older son also became sick. His wife lost one of her contact lenses, and most of her composure. It was not a good beginning to their day in town.

Accidents of this kind do happen at this season of the year, and the cause can be spelled out in a single word: winter. The icy grip of Old Man Winter was felt farther and wider and with greater intensity this year than it has for a great many years previously. Consequently airport runways and taxiways which have never been disturbed before by the pressures of spring thawing, refreezing and thawing again, are suffering visibly.

In past years accidents involving poorly maintained runway, taxiway and ramp areas have not amounted to more than several dozen a year—most of these at smaller landing facilities—but the number may rise this spring, because of the severe winter. An alert attitude on the part of the pilot can forestall an unpleasant surprise when the landing gear pounds into a pothole. The pilot can be lulled into complacency by hundreds—even thousands—of previous, uneventful landings which give him no reason to suspect a hidden hazard in the touchdown zone.

As a matter of fact, *most* runways are well-constructed and well-maintained, and hold up remarkably well, even under heavy use and severe weather. (For comparison, consider the roads and highways bordering the airport property.) FAA construction standards for airports are appropriately high. (These standards are *required* at Federally funded airports, and are vountarily followed, for safety sake, at many others.)

Furthermore, at a Federally "obligated" airport—one that has received Federal grants under the Airport Development Aid Program—the airport management is specifically required to maintain the facility in a safe condition. Even if the airport changes hands, the grant agreement is binding for twenty years after the last funds were received, or for the life of the improvements so funded. Much of the credit for the good quality of the runways of the nation is owed to the fact that millions of ADAP dollars have gone into building and improving runways and taxiways—many of them at airports that are used exclusively or mostly by general aviation.

"Certificated" airports are also required to meet certain standards of safety. (Airports having interstate air carrier service must be certificated by FAA under one of several specific categories.) These airports are periodically inspected by FAA field personnel—professional engineers for the most part, who can tell where improvements are needed, and who make their own recommendations to the operators; still it is possi-

ble for poor runway conditions to develop between inspections.

More importantly, though, to the general aviation flyer, is the fact that of the some 11,000 airports in this country, less than half (about 4,700) are directly regulated by FAA in the above manner. It often comes as a surprise to pilots to find that FAA does not have authority to supervise the operation and condition of every airport—large and small, public and private—in the nation. Some states (about half) have airport licensing laws, and some state or local regulations may require airports to meet certain standards of construction and operation.

By process of elimination, that leaves a lot of airports that are unregulated, so to speak. Any way you view it, the fact remains that the pilot, and no one else, is responsible for seeing that he sets his airplane down in a safe place.

The unsuspecting pilot may get his first inkling that all is not as it was with the runway on a fine spring day, when he finds himself shaken by a rapid-fire barrage of sharp jolts as the wheels strike misaligned concrete slabs. Or on asphalt he may find the nose wheel pounding unmercifully into one pothole after another. On a sod runway he may find himself fighting for control when the airplane wheels are seized by longitudinal ruts that whip the airplane sharply to one side; or he may find himself stuck in a marshy bog that had once been a dependably firm tie-down spot.

To avoid getting into such a quandry, general aviation pilots can make it a special point to consider "state of the runway" conditions as part of their flight planning. Some airports (particularly those without hard-surface runways) are actually closed for short periods in the springtime while the ground is drying out, or the runway is being repaired. Many airport owners will provide this information to the nearest FAA District Office, which can arrange for a NOTAM (Notice to Airmen) to be issued, so it is important to check for the existence of such NOTAMs with the flight service station. (NOTAMs concerning runway closings are also published in the Airman's Information Manual if time permits.)

However, not all airport owners carry their responsibilities this far, and in any case there is often some lag in time between the prevalence of poor landing conditions and publication of the NOTAM. Which means that an alert visual inspection of the airport or a pointed conversation on the UNICOM is always in order before landing at an unfamiliar field. In no-wind conditions you may have the option of missing some bad holes by landing from the opposite end of the runway. And in some cases you might decide a particular field condition is just not for you and your airplane.

The majority of rough runway and taxiway accidents occur at airports that are private, unattended or deserted, and it does not particularly matter whether the surface is concrete, asphalt or sod. Make no mistake about it: Without proper care any type of surface can be affected by weather, given enough time.

Most general aviation hard-surfaced runways are paved with asphalt, laid over several inches of gravel or coarse stone. Asphalt has considerable elasticity which enables it to accommodate some movement of the earth without cracking, and of course it has no seams or joints to split apart. However, if the asphalt surface is not waterproofed periodically, or if hollows develop where water collects and stands, it will seep through to the base eventually and wash away some of the supporting material. This leads to sagging and collapse of the upper surface, and to the formation of cracks and potholes. Sometimes the break in the pavement is not actually visible to the unsuspecting visiting pilot because of standing water.

Concrete runways or taxiways are normally found only at large airports with heavy air carrier traffic. Concrete, which is more expensive to apply than asphalt, has a higher load-bearing capacity in relation to thickness, and higher resistance to the destructive effects of weather. It also resists deterioration from oil or fuel spillage better than asphalt, and for this reason is often used for parking ramps and around hangars at all types of airports. Jet fuel spills on ramps, incidentally, cause more harm to the surface than gasoline, since jet fuel evaporates much more slowly.

Concrete, being a rigid material which expands and contracts with temperature change, is laid down in slabs, separated by expansion joints. These are filled with a flexible binder which will compress and extrude or shrink as the concrete shrinks or expands. Over the winter, as the concrete compresses, the joints may separate enough to admit material which is essentially incompressible, such as sand or water (when frozen).

When this type of material infiltrates the joints in concrete, tremendous pressures are generated during later expansion of the slabs, and the concrete may fracture in the joint area. This is known as *spalling*. The fractured *edges* permit rain to enter the subsurface—with progressively destructive effect. Washing away of sub-base can lead to empty spaces under the slabs which in

turn causes the slabs to rock and sometimes to break.

Incompressible material in the expansion joints can also cause the slabs to pop-out. It can also cause slabs to buckle upward, cracking the surface and providing many avenues for water to enter the sub-base.

Periodic on-the-ground inspections by users or airport owners can easily spot joint openings, surface cracks, etc., before the runway becomes a hazard to aviation. Some of the obvious indications of possible future runway and taxiway problems include:

- Ponding of water on or near runways and taxiways.
- Buildup of soil or heavy turf at pavement edges, preventing water runoff.
- Clogged or overgrown ditches.
- Erosion of soil at runway edges.
- Open or silted in joints.
- Surface cracking or crumbling.
- Undulating or bumpy surfaces.

Airport management usually appreciates having these problems called to their attention, since frequently a patch in time—which prevents water from getting at the underlying courses—may save a major reconstruction job. (Besides, no airport operator wants to see an airplane crumpled up on his runway because of a faulty surface.) Chances are repairs will be made as soon as possible.

In any case FAA, and particularly the local Flight Standards General Aviation District Office (GADO), is interested in knowing about neglected and unsafe conditions at airports (and elsewhere) and so has designed the "Safety Improvement Report" form. Found in most airport offices and all FAA district offices and flight service stations, this report is something like an oversized postcard, pre-addressed to the appropriate district office and needs no stamp. There is ample room to describe any aviation hazard that you might notice. You do not need to sign your name unless you wish.

When these cards are received at the GADO, the Accident Prevention Specialist follows up in a manner appropriate to the situation. Often a phone call or visit from the APS provides the impetus needed to get a long-delayed but much needed improvement program under way.

If a serious hazard exists at an airport, and cannot be immediately remedied a Notice to Airmen (NOTAM) may go out for

Undulation of the runway at left, resulting from the ground freezing and thawing, is clearly visible at the ground level but might not be noticed from the air except by a very sharp eye. A check of NOTAMs and/or a UNICOM query before using a strange airport is recommended.

Most airport operators appreciate being told about situations like this, where weather-related erosion has caused the shoulder to sag and is eating into the runway itself

use by FSSs in pilot briefings and possibly for publication in Part 3A of AIM. As a general rule NOTAMs concerning airport closings and hazards are initiated by the airport owner, operator, manager, etc., but FAA can request that a NOTAM be issued if the circumstances dictate.

Normally, the pilot is the first person in a position to know when his airplane has suffered a hard landing which may have caused structural damage. Before he or anyone else uses the plane again it should be checked for possible broken springs, ruptured landing gear struts, ruptured brake lines, buckled or cracked metal, etc.

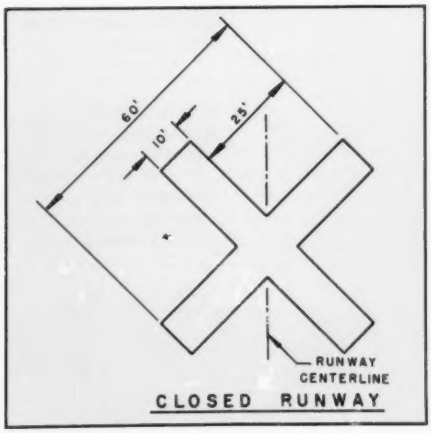
Tires, incidentally, are also a vulnerable part of the landing gear, and can be cut against jagged edges of broken runway surface. Propeller damage can easily go unnoticed in a poorly controlled landing that terminates beyond the runway edge. The aircraft really needs to be examined carefully from stem to stern.

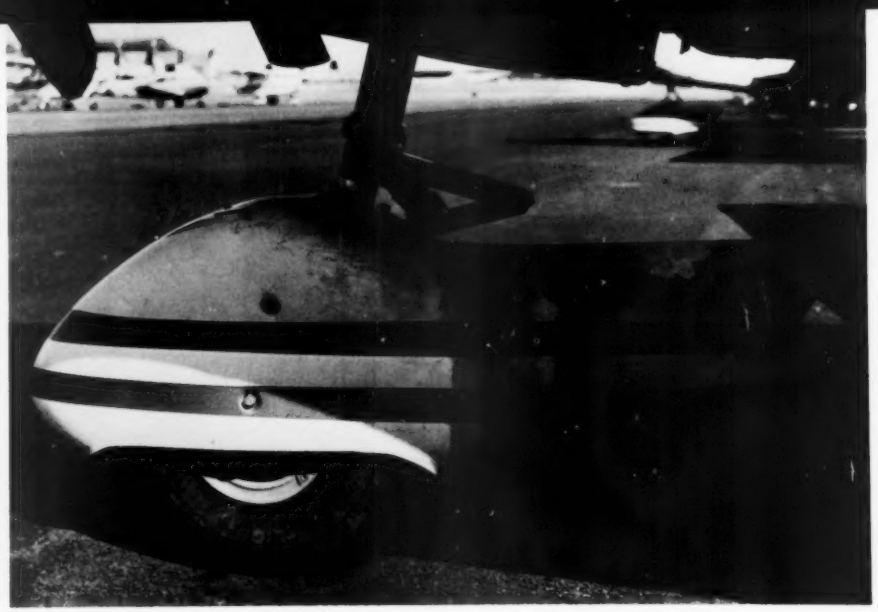
Airport accidents at this time of the year are not confined to the runway. A case in point recently involved an Aeronca *Champ* which lost its left gear, bent the prop and damaged an aileron heavily when the owner/pilot taxied into a hole in the meadow, after executing a cautious and perfectly controlled landing on wet sod in Arkansas. In her accident report the pilot estimated she was taxiing only about five miles per hour when the left wheel dropped into a hole about two feet deep and nearly as wide. She said that the only marking of the hole was a pair of tiny red flags, about birthday cake size, and nearly weathered to shreds—which of course she had not seen.

The airport owner acknowledged that the hole was a hazard, but stated that local pilots knew about it and looked out for the flags. He said that a big woodchuck had moved in last fall, and considering how hard the winter had been, nobody had the heart to plug up his hole.

He also asked the lady to put the flags back. ■

The X that marks the spot of a closed runway must be conspicuous from the air. Recommended marking specifications are below.





You made a bad bounce after hitting a hole on landing; now you find the nose strut flat and fluid leaking out, probably from a broken seal. This type of occurrence (not unusual in rough-runway incidents) could also result in more serious gear-attachment damage. Tell your mechanic the whole story and have him check it thoroughly. *Below*—the grass looked deceptively smooth from the air. However, a storm the previous night had left a lot of standing water underneath the grass, and before the airplane could be stopped it had skidded off the strip onto some rocks.

Frequently amended Parts of the Federal Aviation Regulations are sold on subscription; changes (numbered in parentheses) are sent out gratis to subscribers. Infrequently amended Parts are sold as single sale items; the changes are sold separately. Changes made during the past quarter are indicated in color. FARs may be purchased only from the Superintendent of Documents, GPO, Washington, D.C. 20402.

FARs

NOTICE: Prices shown are those in effect as of April 1, 1977, and are subject to change without notice.

FAA SEPARATE PARTS	TITLE	PRICE
Parts sold by subscription		+ foreign mailing
Part 1	Definitions and Abbreviations (3)	$3.00 + 75c
Part 21	Certification Procedures for Products and Part (6)	$3.75 + 95c
Part 23	Airworthiness Standards: Normal, Utility and Acrobatic Category Airplanes (3)	$3.55 + 90c
Part 25	Airworthiness Standards: Transport Category Airplanes (3)	$6.60 + $1.65
Part 33	Airworthiness Standards: Aircraft Engines (2)	
Part 36	Noise Standards Aircraft Type and Airworthiness Certification (6)	$3.00 + 75c
Part 37	Technical Standard Order Authorizations (5)	$5.65 + $1.45
Part 63	Certification: Flight Crewmembers Other Than Pilots (2)	$3.00 + 75c
Part 91	General Operating and Flight Rules (15)	$11.30 + $2.85
Part 93	Special Air Traffic Rules and Airport Traffic Patterns (5)	$2.45 + 65c
Parts sold as single copies (foreign mailing add 25% of total price)		
Part 11	General Rule-making Procedures	$0.55
	Change 1	$0.45
	Change 2	$0.35
	Change 3	$0.40
Part 13	Enforcement Procedures	$0.70
	Change 1	$0.40
	Change 2	$0.40
Part 27	Airworthiness Standards: Normal Category Rotorcraft	$2.10
	Change 1	$0.75
	Change 2	$0.40
	Change 3	$1.30
Part 29	Airworthiness Standards: Transport Category Rotorcraft	$1.70
	Change 1	$0.70
	Change 2	$0.35
	Change 3	$0.40
	Change 4	$1.35
Part 31	Airworthiness Standards: Manned Free Balloons	$0.40
	Change 1	$0.65
Part 35	Airworthiness Standards: Propellers	$0.35
	Change 1	$0.65
**Part 39	Airworthiness Directives	$0.35
Part 43	Maintenance, Prevention Maintenance, Rebuilding and Alteration	$1.80
Part 45	Identification and Registration Marking	$0.65
Part 47	Aircraft Registration	$0.85
	Change 1	$0.40
Part 49	Recording of Aircraft Titles and Security Documents	$0.50
	Change 1	$0.40
Part 61	Certification: Pilots and Flight Instructors	$2.90
	Change 1	$0.50
Part 65	Certification Airmen Other Than Flight Crewmembers	$1.25
Part 67	Medical Standards and Certification	$0.50
	Change 1	$0.40
*Part 71	Designation of Federal Airways, Area Low Routes, Controlled Airspace and Reporting	$0.85
	Change 1	$0.35
*Part 73	Special Use Airspace	$0.40
	Change 1	$0.30
*Part 75	Establishment of Jet Routes and Area High Routes	$0.40
	Change 1	$0.40
Part 77	Objects Affecting Navigable Airspace	$1.10
**Part 95	IFR Altitudes	$0.50
	Change 1	$0.35
**Part 97	Standard Instrument Approach Procedures	$0.45
Part 99	Security Control of Air Traffic	$0.70
	Change 1	$0.40
Part 101	Moored Balloons, Kites, Unmanned Rockets and Unmanned Free Balloons	$0.65
	Change 1	$0.35
Part 105	Parachute Jumping	$0.55
	Change 1	$0.40

FAA SEPARATE PARTS	TITLE	PRICE
Parts sold by subscription		+ foreign mailing
Part 103	Transportation of Dangerous Articles and Magnetized Materials (8) NOTE: was revoked 7/1/76. Regulations are issued by DOT's Hazardous Materials Bureau in Part 175—Carriage by Aircraft, effective 7/1/76, published in 41 F.R. 16106, 4/15/76.	$2.20 + 55c
Part 121	Certification and Operation: Domestic, Flag, and Supplemental Air Carriers and Commercial Operators of Large Aircraft	$9.20 + $2.30
Part 123	Certification and Operations: Air Travel Clubs Using Large Airplanes (2)	$2.00 + 50c
Part 139	Certification and Operations: Land Airports Serving CAB Certified Scheduled Air Carriers Operating Large Aircraft (Other Than Helicopters	$3.00 + 75c
Part 107	Airport Security	$0.40
	Change 1	$0.40
Part 127	Certification and Operations of Scheduled Air Carriers with Helicopters	$1.80
	Change 1	$0.35
	Change 2	$0.65
Part 129	Operations of Foreign Air Carriers	$0.45
	Change 1	$0.35
	Change 2	$0.40
	Change 3	$0.35
Part 133	Rotorcraft External Load Operations	$0.55
	Change 1	$0.35
Part 135	Air Taxi Operators and Commercial Operators of Small Aircraft	$2.50
	Change 1	$0.35
	Change 2	$0.35
	Change 3	$0.45
	Change 4	$1.35
Part 137	Agricultural Aircraft Operations	$0.50
	Change 1	$0.35
	Change 2	$0.40
Part 141	Pilot Schools	$1.15
Part 143	Ground Instructors	$0.45
Part 145	Repair Stations	$0.50
	Change 1	$0.40
Part 147	Aviation Maintenance Technician Schools	$0.65
	Change 1	$0.40
Part 149	Parachute Lofts	$0.35
Part 151	Federal Aid to Airports	$1.55
Part 152	Airport Aid Programs	$1.35
	Change 1	$0.40
	Change 2	$0.45
Part 153	Acquisition of U.S. Land for Public Airports	$0.50
Part 154	Acquisition of U.S. Land for Public Airports Under the Airport and Airway Development Act of 1970	$0.40
Part 155	Release of Airport Property from Surplus Property Disposal Restrictions	$0.40
Part 157	Notice of Construction, Alteration, Activation and Deactivation of Airports	$0.40
Part 159	National Capital Airports	$1.00
	Change 1	$0.35
Part 169	Expenditure of Federal Funds for Non-Military Airports or Air Navigation Facilities Thereon	$0.35
Part 171	Non-Federal Navigation Facilities	$1.10
	Change 1	$0.65
Part 183	Representatives of the Administrator	$0.45
	Change 1	$0.35
Part 185	Testimony by Employees and Production of Records in Legal Proceedings and Service of Legal Process and Pleadings	$0.35
Part 187	Fees	$0.40
Part 189	Use of Federal Aviation Administration Communications System	$0.40
Part 191	Withholding Security Information from Disclosure Under the Air Transportation Security Act of 1974	$0.40

*Due to the complexity, length and frequency of issuance, changes to Parts 39, 71, 73, 75, 95 and 97 are published in the Federal Register and on appropriate aeronautical charts, but are not included in the basic Parts.

**Published in the Federal Register by reference to FAA documents which can be examined in FAA HQ, Washington, D.C., at the Rules Docket (AGC-24) and the National Flight Center; also at FAA regional offices or Flight Inspection District Offices.

MAGNETO MAGIC

The ENGINE DOCTOR:

MR. ENGINE DOCTOR, I have a problem—or rather, my engine has. Can you help me?

A. I hope so. Please unburden yourself.

Q. Well, a few weeks ago I flew down to Ellicot, which is a small—really very small—airport in the southern part of our state, and when I was getting ready to leave and ran the engine up, the mag drop on the left magneto was more than the manual allows for, and it did not get any better after I revved the engine. Well, there wasn't any maintenance on the field, so the only thing I could do, to be on the safe side, was to call up my own mechanic, and ask him to get in a plane and fly a hundred miles down there to fix it. Can you imagine that?

A. I can. I trust that your trustworthy mechanic obliged you.

Q. Sure he did. He spent about ten minutes under the cowl, and then had me fire up the engine and presto! No more bad mag drop. That is, not until last Friday, when the same thing happened to me again, at a different airport. My question is, How serious is a bad mag drop? Is it serious enough for me to spend all that time and money on a mechanic to check it out, when he has to fly in from another airport? Or could I just take off and kind of ease the plane back home myself? I bet I could have bought half a dozen new magnetos for what I've spent on this kind of maintenance lately.

A. You could, and still have the same problem. What we call a mag drop is simply the number of rpm we lose at a given power setting when the engine is firing on one of the dual ignition systems alone. When that drop is excessive, it indicates a problem somewhere in the system—perhaps, but not necessarily, in the magnetos. Most commonly the fault is in the spark plugs, or in the wire leads from the magneto to the plugs. In any case it is not safe to fly the plane until you have it repaired. In fact, it is legally not airworthy in that condition.

Q. What's the point of having a dual ignition system if you can't fly home on one alone?

A. The main purpose of a dual system is to get you safely to the ground in the event you have an ignition problem in flight. If you take off with a known problem in one of the two systems, you are giving up the fail-safe principle. If the problem is only one or two fouled plugs, you may get home all right—and you may not. An underpowered engine tends to aggravate existing problems you might not be aware of.

Q. I don't think I understand the relationship of the magneto to the spark plug. Can you explain that in simple terms?

A. Let me try: The magneto is the source of the electrical current that makes the plug "spark" at the right time. O.K.? You might say that a magneto combines the functions of a generator, a transformer, and a distributor.

Q. Is it the same as the ignition system in my car?

A. Not quite. Your car has a battery-ignition system—no magnetos. The plugs in your car will not fire unless some current is drawn from your battery. Your aircraft has a magneto-ignition system and the magneto generates all of its own electricity. It would keep on firing the plugs even if your battery dropped out of the airplane.

Q. Where does the electricity come from?

A. Mechanical rotation. The engine is geared to move a magnet within the magneto housing past a conductor, which has a wire coil wrapped around it. This movement induces an electric current to flow in the coil. A secondary coil with many more turns of wire is wrapped around the primary coil; this steps up the voltage, transforms it high enough to jump the gap between the spark plug electrodes, when the engine is turning over fast enough. At 2,100 rpm, for example, the plug could be subjected to electrical pressure as high as 15,000 volts or more. I am oversimplifying, of course, but you probably don't want all the nitty gritty.

Q. How is this system any better than an automobile ignition?

A. It is safer, as I said, because it generates its own electricity. As a matter of fact, early aircraft carried no battery—the weight was excessive—so you might say that it is a virtue developed of necessity. Because the magneto is relatively light and compact, (it is about the size of a large grapefruit and weighs 6-8 lbs.) and produces a minimal drag on the engine, it is possible to have two virtually independent ignition systems in one airplane.

Q. Will the engine operate just as well on one magneto that is in good condition as on two?

A. Almost, but not quite. Two spark plugs in the combustion chamber produce a more even "burn" than one plug can give you, even in perfect condition. That is why some mag drop—really rpm drop—is permissible and expected.

Q. Why do you get a mag drop when you apply carburetor heat?

A. You get some rpm drop with both mags when you turn on carburetor heat because warmed air is less dense, as you know, than cold, ambient air. That gives you a less-than-optimum fuel/air mixture, which means slightly less power. But that is highly preferable to the icing problems it is intended to circumvent.

Q. I'm still confused about the battery. My airplane has a battery and a generator and magneto but you say one has nothing to do with the other.

A. The battery in your aircraft is there to operate various auxiliary systems such as lights, radio, trim, starter motor, etc. A separate generator or alternator is required to keep the battery charged—but it has no connection with engine ignition. Except, of course, in cranking the engine which has to be turning over at a minimum speed—about 300 rpm—before the magneto can generate enough voltage for a good spark.

Q. If that's true, how can you ever manage to start an airplane engine by handpropping it? You could never turn it over that fast.

A. No, you certainly could not. Some form of voltage booster is needed for starting, whether you handprop it or use a starter motor. There are two basic means of boosting voltage: one uses what is called an "impulse coupler," and the other uses an "induction vibrator."

Left, both, right, both. Going directly from "left" to "right" can give you an inaccurate test on your preflight mag check. A check of the "off" position is also recommended.

Very basically, the impulse coupler has a coiled spring that attaches the magneto drive shaft to an engine accessory drive shaft. When the engine is turned over, the spring tightens until it is fully compressed, then releases, spinning the magneto rapidly enough to send a strong spark to the plug in a cylinder undergoing compression. With a cold engine, the single spark may not always be sufficient to fire up the engine on the first try. This type of booster has the advantage of not depending on external power.

The induction vibrator type of booster requires current from the battery, which is drawn through the primary magneto coil, built up into high voltage and released at the proper instant as a *consecutive stream of sparks*—about 200 impulses per second. Both types of boosters are disconnected automatically once the engine starts.

Q. If it takes that much trouble to start an airplane engine, how is it possible—or is it possible—for me to start the engine unintentionally by just leaning against the prop?

A. Believe me, it is possible. For all you know, someone else may have rotated the prop before you leaned against it—just enough to compress that spring in the impulse coupler. One more nudge, and boom! The engine may fire one or more cylinders, enough for a lethal swipe of the prop.

Q. How is it possible to get a spark, unless the switch is on?

A. In the "off" position, all the magneto switch does is *ground* the circuit. If for some reason you develop a broken ground connection, you have a live circuit. Remember, the magnetos produce their own electricity. All the master switch does is supply current to the starter motor, and this is not always essential for starting the airplane.

Q. What kind of maintenance do magnetos require?

A. The magneto itself is a closed component that requires no pilot maintenance to speak of—your mechanic will check it during scheduled inspections. However, you should keep an eye out for any deterioration of the wire leads from the magnetos to the plugs. These are high tension wires (in most general aviation aircraft), carrying something like 15,000 to 20,000 volts, and they need to be well insulated. Fraying or worn spots in the insulation will permit leakage of current, resulting in poor ignition.

Q. What kind of mechanic maintenance is needed? Can a mechanic repair a mag, or does a bad one have to be thrown away?

A. They are never thrown away. Certain types of magnetos are *sealed* units which have to be replaced by a new or exchange unit if ignition trouble is traced to their behavior. Most models periodically require inspection of fittings, connections, breaker points (replacement where necessary) and timing.

Q. How long do magnetos last?

A. Most of them will last the lifetime of the engine. They are routinely overhauled—or replaced—at the time of an engine overhaul.

Q. Is there anyway I, as a pilot, can tell if the magneto itself is about to stop working? Any telltale symptoms to watch for, before I head out over the Pacific?

A. No, all you can do is check your rpm drop on runup carefully. Ignition problems tend to sneak up on you, rather than emerge abruptly. The rpm drop can tell you a lot—it is something like taking the pulse of the engine.

Q. What can it tell me, other than it's go or no-go?

A. Well, supposing the individual mags on your airplane normally show a 50 rpm drop on runup, and one day your right mag, say, gives you a 90 rpm drop. Even though this is within the acceptable tolerance for your aircraft, the abrupt change suggests something has happened other than normal wear—and it bears watching. If you just look to

see whether the mag drop is within limits, you might not notice significant changes. Of course, it is more difficult with rental or club aircraft than with your own, but you can still look out for "symptoms" of this kind. When the situation gets bad enough to warrant a visit to the shop, if you can fill the mechanic in on the *history* of the problem, you might save yourself some money because he will know where to start looking.

Q. Isn't he going to check out the whole system, regardless of what I tell him?

A. Only if necessary. For example, if your book lists 175 rpm as the maximum allowable rpm drop on one magneto, and a runup check shows a 200 rpm on *each mag*, with a smooth operation, your intelligent mechanic might look first at the fuel mixture adjustment to see if it is too lean or too rich.

On the other hand, if one mag checks out but the other shows a big, *smooth* drop, he might look first at the timing. With a big, *rough* drop, he might start with the spark plugs. The mechanic will observe what he can by running the engine, but if you fill him in on it past performance, that makes it a lot easier for him to put two and two together.

Q. Gotcha. Is there any good reason why they always tell you, on the runup, to switch from one mag back to both before checking the other mag, or is that just a tradition?

A. It's the straight goods. Visualize what happens. While you are checking out one magneto system alone, the spark plugs in the other system are not firing, and may become somewhat fouled from unburned fuel. If you then switch directly to the other magneto, it will be operating on fouled plugs, and may appear to be in worse condition than it actually is. If you go back to "both" first, you give the fouled plugs a chance to burn clean before you test that system.

Q. What about ignition static on the radio—does it come from the magneto or from the plugs?

A. Magnetic radiation can be picked up on your radio if you have a break in the shielding over the spark plug leads that supply high voltage. Quite a few "avionics problems" are traceable to faulty ignition, but the trouble is rarely in the magneto itself. You can learn to identify "magnetic static" quite easily by ear. It is most audible at idling speeds, although it becomes apparent at all speeds when the leakage is really bad.

Q. I'll listen for it. Any other tips for pilots?

A. You can also train your ear to tell you if your magnetos are properly grounded. By this time I am sure you understand why this is important for your safety. You do this test on the ground, while idling the engine. You turn the magneto switch to the "off" position and listen. You should hear (and feel) an immediate change in the engine that indicates it is about to stop, and in fact it *should stop* if you don't switch back promptly. If so, this is good. If not, one or both magnetos were not grounded. Since the engine is stopped normally after a flight by pulling out the mixture control, you could have a faulty magneto ground for months and never know it—until some unfortunate soul leaned against the prop. You can learn to check the ground this way without actually letting the engine die.

Q. Better the engine than the unsuspecting soul, eh? I had no idea that a quiet little magneto was capable of mayhem. What about inflight problems—do you know of any cases where a magneto actually failed in flight and caused an acident?

A. I did hear of a case not long ago where the magneto checked out all right on the ground, but the primary coil shorted out at some point after takeoff. Sometimes the failure takes place only after the engine heats up enough.

Q. What happened?

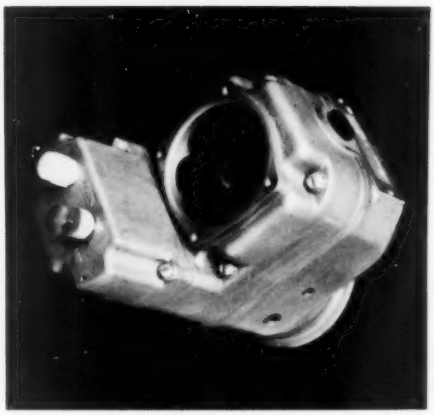
A. Nothing much. That's the beauty of this dual magneto system. The pilot thought his engine felt a little sluggish, so after he completed his flight—I think he went about 700 miles or so—he brought it in for a checkup. That's when we found out about the shorted coil—which was better than discovering it when he revved up before his next flight.

Q. That brings me back to my original question. If I have a slightly bad mag drop, why can't I fly my plane back to my home field for an inspection?

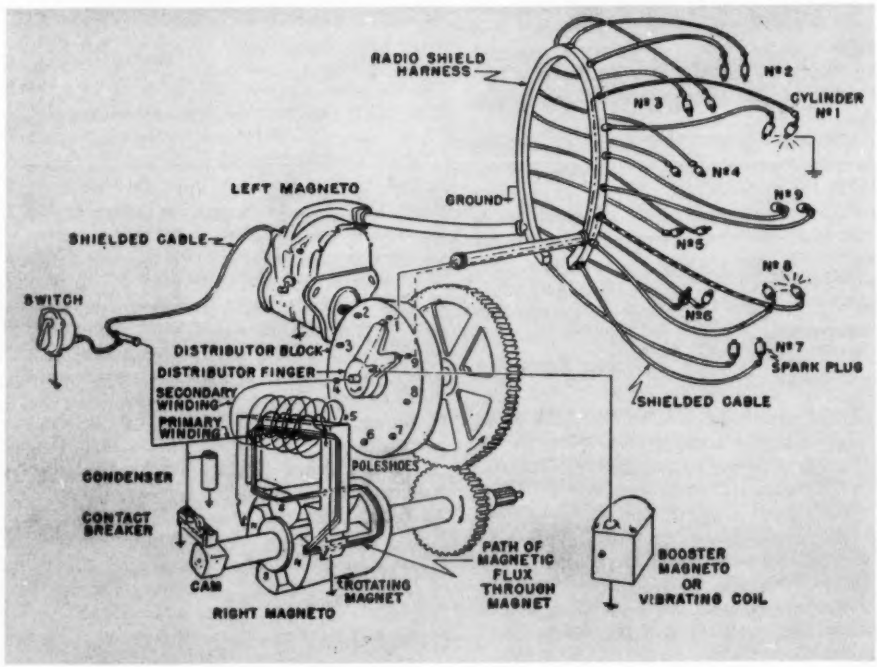
A. Because the good book (of Federal Aviation Regulations) says you can't. FAR 91.165 says "Each owner or operator of an aircraft . . . shall, between required inspections, have defects repaired as prescribed." And FAR 91.29 says that "no person may operate a civil aircraft unless it is in an airworthy condition."

Q. Aren't you being a little bureaucratic?

A. Just thinking of your safety. Next, please.



Rebuilt magneto, ready for installation in Beech *Baron's* Continental engine. *Below*—diagram of high tension magneto system for nine-cylinder radial engine with vibrating coil for starting. Coil windings on cutaway rendering of lower magneto are suggestive.



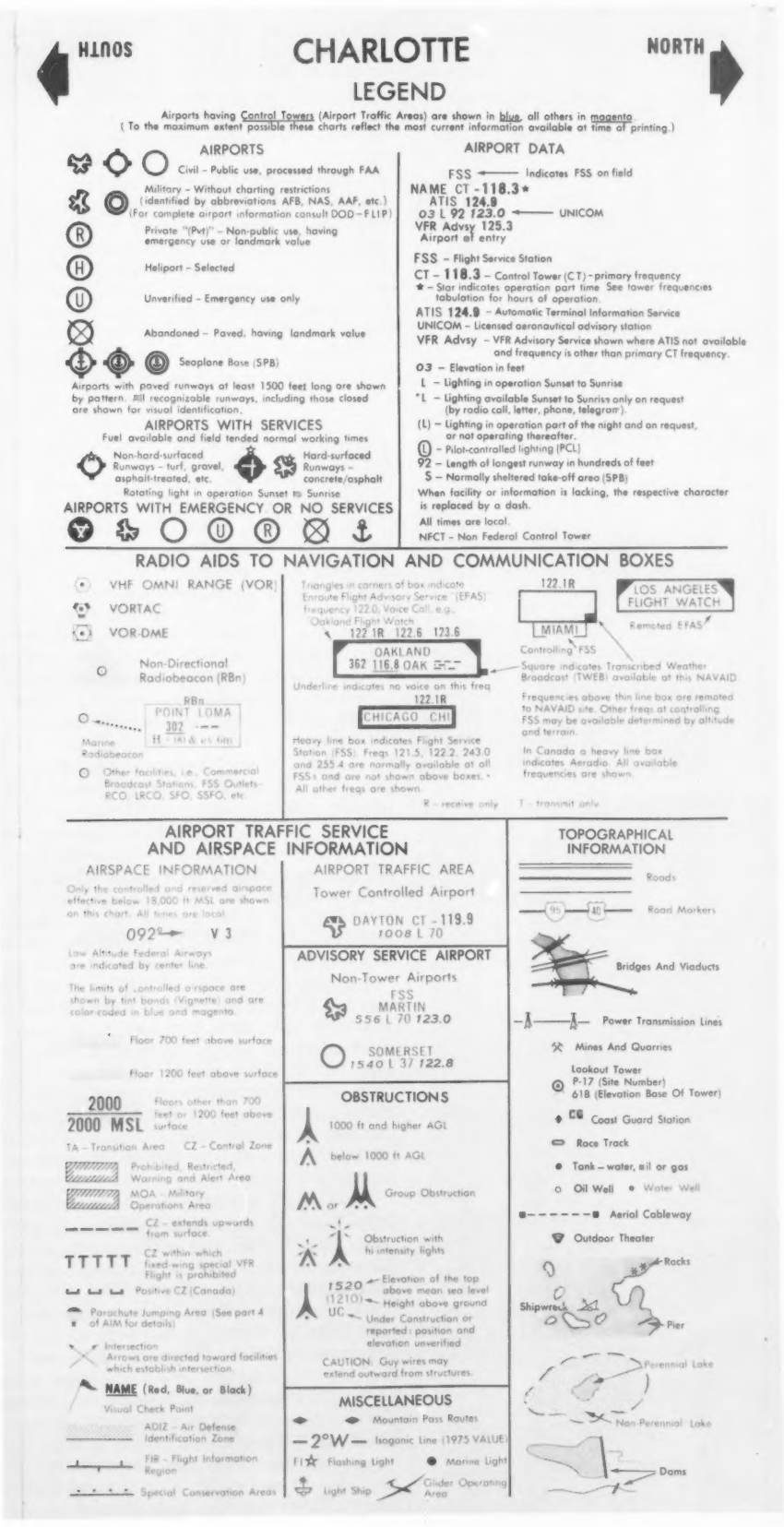

SOUTH
CHARLOTTE
NORTH
LEGEND
Airports having Control Towers (Airport Traffic Areas) are shown in blue, all others in magenta.
(To the maximum extent possible these charts reflect the most current information available at time of printing.)
AIRPORTS
Civil – Public use, processed through FAA
Military – Without charting restrictions (identified by abbreviations AFB, NAS, AAF, etc.)
(For complete airport information consult DOD – FLIP)
Private "(Pvt)" – Non-public use, having emergency use or landmark value
Heliport – Selected
Unverified – Emergency use only
Abandoned – Paved, having landmark value
Seaplane Base (SPB)
Airports with paved runways at least 1500 feet long are shown by pattern. All recognizable runways, including those closed are shown for visual identification.
AIRPORTS WITH SERVICES
Fuel available and field tended normal working times
Non-hard-surfaced Runways – turf, gravel, asphalt-treated, etc.
Hard-surfaced Runways – concrete/asphalt
Rotating light in operation Sunset to Sunrise
AIRPORTS WITH EMERGENCY OR NO SERVICES
AIRPORT DATA
FSS ← Indicates FSS on field
NAME CT – 118.3 *
ATIS 124.8
03 L 92 123.0 ← UNICOM
VFR Advsy 125.3
Airport of entry
FSS – Flight Service Station
CT – 118.3 – Control Tower (CT) – primary frequency
* – Star indicates operation part time. See tower frequencies tabulation for hours of operation.
ATIS 124.8 – Automatic Terminal Information Service
UNICOM – Licensed aeronautical advisory station
VFR Advsy – VFR Advisory Service shown where ATIS not available and frequency is other than primary CT frequency.
03 – Elevation in feet
L – Lighting in operation Sunset to Sunrise
*L – Lighting available Sunset to Sunriss only on request (by radio call, letter, phone, telegram).
(L) – Lighting in operation part of the night and on request, or not operating thereafter.
(L) – Pilot-controlled lighting (PCL)
92 – Length of longest runway in hundreds of feet
S – Normally sheltered take-off area (SPB)
When facility or information is lacking, the respective character is replaced by a dash.
All times are local.
NFCT – Non Federal Control Tower
RADIO AIDS TO NAVIGATION AND COMMUNICATION BOXES
VHF OMNI RANGE (VOR)
VORTAC
VOR-DME
Non-Directional Radiobeacon (RBn)
RBn
POINT LOMA
302
Marine Radiobeacon
Other facilities, i.e., Commercial Broadcast Stations, FSS Outlets-RCO, LRCO, SFO, SSFO, etc.
Triangles in corners of box indicate Enroute Flight Advisory Service (EFAS) frequency 122.0. Voice Call, e.g., "Oakland Flight Watch"
122.1R 122.6 123.6
OAKLAND
362 116.8 OAK
Underline indicates no voice on this freq
122.1R
CHICAGO CHI
Heavy line box indicates Flight Service Station (FSS). Freqs 121.5, 122.2, 243.0 and 255.4 are normally available at all FSSs and are not shown above boxes. All other freqs are shown.
122.1R
MIAMI
LOS ANGELES FLIGHT WATCH
Remoted EFAS
Controlling FSS
Square indicates Transcribed Weather Broadcast (TWEB) available at this NAVAID
Frequencies above thin line box are remoted to NAVAID site. Other freqs at controlling FSS may be available determined by altitude and terrain.
In Canada a heavy line box indicates Aeradio. All available frequencies are shown.
R – receive only T – transmit only
AIRPORT TRAFFIC SERVICE AND AIRSPACE INFORMATION
AIRSPACE INFORMATION
Only the controlled and reserved airspace effective below 18,000 ft MSL are shown on this chart. All times are local.
092° V 3
Low Altitude Federal Airways are indicated by center line.
The limits of controlled airspace are shown by tint bands (Vignette) and are color-coded in blue and magenta.
Floor 700 feet above surface
Floor 1200 feet above surface
2000
2000 MSL
Floors other than 700 feet or 1200 feet above surface
TA – Transition Area CZ – Control Zone
Prohibited, Restricted, Warning and Alert Area
MOA – Military Operations Area
CZ – extends upwards from surface.
TTTTT CZ within which fixed-wing special VFR Flight is prohibited
Positive CZ (Canada)
Parachute Jumping Area (See part 4 of AIM for details)
Intersection
Arrows are directed toward facilities which establish intersection.
NAME (Red, Blue, or Black)
Visual Check Point
ADIZ – Air Defense Identification Zone
FIR – Flight Information Region
Special Conservation Areas
AIRPORT TRAFFIC AREA
Tower Controlled Airport
DAYTON CT – 119.9
1008 L 70
ADVISORY SERVICE AIRPORT
Non-Tower Airports
FSS
MARTIN
556 L 70 123.0
SOMERSET
1540 L 31 122.8
OBSTRUCTIONS
1000 ft and higher AGL
below 1000 ft AGL
or
Group Obstruction
Obstruction with hi-intensity lights
1520 Elevation of the top above mean sea level
(1210) Height above ground
UC Under Construction or reported; position and elevation unverified
CAUTION: Guy wires may extend outward from structures.
MISCELLANEOUS
Mountain Pass Routes
–2°W– Isogonic Line (1975 VALUE)
Fl☆ Flashing Light
Marine Light
Light Ship
Glider Operating Area
TOPOGRAPHICAL INFORMATION
Roads
Road Markers
Bridges And Viaducts
Power Transmission Lines
Mines And Quarries
Lookout Tower
P-17 (Site Number)
618 (Elevation Base Of Tower)
Coast Guard Station
Race Track
Tank – water, oil or gas
Oil Well
Water Well
Aerial Cableway
Outdoor Theater
Rocks
Shipwreck
Pier
Perennial Lake
Non-Perennial Lake
Dams

CHART SYMBOLS

FAA sectional charts issued in February of 1977, and thereafter, contain a number of new details designed to offer additional navigational assistance to the pilot

The redesigned legend and reference format which is printed on the sectional margin shows these new items:

1. *Topographical information.* All of the topographical items are now collected in a ruled off area in the lower righthand corner of the legend. The new items included are marine information, such as piers and shipwrecks; perennial and nonperennial lakes; and dams. New road markings are also indicated. An important addition which clarifies possible previous confusion is the explanation of the symbol for a lookout tower. A lookout tower is indicated by a small black and white circle with a triangle in the middle; the height of these towers is shown on the chart when feasible.

2. *Glider operating areas.* Also new to the sectional is a symbol for a glider operating area, a figure of a small magenta-colored glider in flight. This symbol indicates areas where glider operations frequently occur.

3. *Airports.* The new sectionals continue to use the "L" symbol for nighttime lighting at an airport. The "L" by itself indicates that lighting is in operation from sunset to sunrise; the "L" with an asterisk in front of it indicates that lighting is available from sunset to sunrise upon request; and the "L" in brackets indicates that lighting is available part of the night upon request. A new symbol is the letter "L" enclosed in a circle, and it indicates pilot controlled lighting (PC). A star after the tower frequency indicates part-time tower operation.

Other chart changes are planned for the near future: Starting in April, the entire TCA will be shown on sectionals, with segments, floors and ceilings. Then beginning in June, sectional charts will show "Maximum Elevation Figures" (which include towers, trees, buildings, etc.) rather than "Maximum Terrain Elevation Figures" as shown on charts now.

Famous
FLYERS

Curtis Pitts and the Little Bipe That Bit Its Own Tail

How would you like to own a tiny, compact, open-cockpit, highly maneuverable biplane that does things like *Immelman* turns and hammerhead stalls with ease, will flutter down in a reverse corkscrew, can be built in your own backyard, and is capable of winning in international aerobactic competition?

Naturally you would love it—but where or how can you get it? That is the idea that started Curtis Pitts, another unheralded Georgia farm boy from Sumpter County (which includes Plains) on the path to aeronautical fame, and endeared him to the hearts of hundreds of aviation enthusiasts for whom control and feel and touch make up the essence of flying—rather than speed, or size, or convenience.

Curtis H. Pitts had little technical training and no formal education beyond high school, but he had a creative mind, a clearcut ambition, and from early childhood it was known that he could do wonders with his hands. Born on December 9, 1915, near Americus, Ga., he found time between chores to build his first airplane when he was fifteen. He remembers it as ". . . a kind of hybird . . . mostly wood and shop scraps, never really flew, just hopped a few feet off the ground."

Pitts—the man and the machine. Spunky little Pitts has long been a big favorite with aerobatic pilots and an estimated 600 single-seaters have been built by amateurs. But learning to put this highly sensitive bird through its paces is no do-it-yourself job, it requires extensive preparation and training.

Within a few years Pitts was doing his farming from the sky, gunning a small *Stearman* through the weevil-infested rows of cotton. Between dusting stints he taught aerobatic flying in a dilapidated *Waco* trainer in St. Augustine, Fla. As American entry into World War II neared, Curtis found full-time employment as a civilian mechanic at the Naval Air Station in Jacksonville, which gave him a practical education in the construction of nearly every type of small military aircraft. He also continued to operate his little flying school on weekends, but after constantly replacing the *Waco's* worn parts he decided it would be cheaper to build a plane of his own.

While improving his textbook education with a correspondence course in mechanical engineering, he became a close friend of one of the navy welders, Phil Quigley, with whose help he designed, built, rebuilt, and rebuilt, and eventually flew one of the world's most maneuverable and compact planes, the *Pitts Special.*

The Pitts S-1 *Special* was the original single seater, a stagger-wing biplane designed in 1943, and test flown in 1945. Powered originally by a 55 hp Lycoming and later by a 90 hp Franklin engine, it was sometimes described as a plane that "could bite its own tail." Like all of the Pitts planes to follow, it was stubby and compact, with tight construction, and tremendous response. Pilots came to feel the airplane as part of their own bodies.

The wings were wooden with fabric covering and ailerons on lower wing only. The fuselage was of welded steel tubing, also covered with fabric. A steerable tail wheel and hydraulic-braked main wheels made up the (non-retractable) landing gear. The propeller was wooden and fixed pitched, and the fuel tank held 20 gallons. Problems with fuel flow when inverted led to this prototype being sold and later scrapped.

The second Pitts *Special* fulfilled all of its creator's expectations. It leapt off the ground after a brief 300 foot takeoff run, bored ho'es vertically in the sky and performed every acrobatic maneuver known to man. Only 14′3″ long, with a wingspan of 17′4″ and an empty weight of merely 617 lbs. 950 lbs. gross), the *Special* had a top speed of 147 mph with the 90 hp engine and landed at 55 mph.

After seeing the Pitts *Special* perform in several air shows, aviatrix Betty Skelton bought the "Little Stinker," as it was affectionately known, painted a minute skunk on the rudder, and proceeded to win the national aerobatic championships for women four years in a row.

Meanwhile Curtis Pitts continually modified and improved his aerobatic design, and in 1965 he patented his symmetrical wing airfoil which made the airplane completely responsive upside down. With a 180 hp engine the little Pitts was now able to fly at 170 mph and climb at a rate of 2,600 f/p/m. The airplane had become a bit

longer (15'6") but no wider of wing and only slightly heavier (720 lbs. empty). And it was still stressed for 9 g's, plus or minus —considerably more than most pilots cared to pull.

Over the years title after title was won by pilots in a Pitts *Special,* and in 1972, in the International Competition held at Salon de Provence, France, against vastly bigger Russian *Yaks* and Czech *Zlins,* both the men's and women's championship were won in the little red machines (Charlie Hillard and Mary Gaffaney).

The stubby little biplane was said to incorporate the "spirit of a fighter in the body of a humming bird." The charm and simplicity of early day flying had been restored, without the castor oil in the eye. *Who could ask for anything more?*

The distinctive red and white striped miniplanes became a thrilling fixture at airshows all over the world, but nevertheless the Pitts *Special* did not become a production aircraft for 25 years. Apart from a handful of what Curtis called "Us akronuts," not many people wanted to buy a single-seater airplane with a zero payload, a 200 mile range, and no protection from the wind and the rain and the sun. Pitts kept himself busy running a fixed-base operation, a mechanics school and an ag flying business all at the same time.

In 1962 Curtis began selling his plans and building instructions for the S-1 to a small but dedicated coterie of aviation buffs who were willing to spend some 2,000 hours or more with their own tools, plus a modest cash outlay, to put themselves in the cockpit of their own aerobatic wonder.

In 1963, after "much pestering," Curtis began work on a two-place version of the *Special.* First flown in 1966, the S-2 was about two feet longer than the S-1, with a 20 foot wingspan and either a 180 or 200 hp engine with a controllable propeller. From the first it was intended as a *production* aircraft, but obtaining the necessary type certificate required five more years of sweat and strain. The new aircraft was not modeled on any theoretical calculation, but developed from the Pitts' system of "Design it, try it, change it, try it again." Conforming his specifications to FAA certificate requirements was no easy matter for this individualistic Georgia country boy.

But he persisted, and in the end won certificates for both the "two-holer" and single-seater *Specials;* and both were built at the Call-Air plant in Afton, Wyo. The S-1 is still available to the enthusiast who wishes to assemble it from a kit or build it himself from plans. In 1976 Curtis, who still lives in Florida, sold out his aircraft interests to Aerotek of Afton. Building aircraft, he explained, was just too much work for him—". . . flying is something to be enjoyed."

Probably no one else in the world has done as much to put the pure joy of flying back in the hands of pilots. ■

BRIEFS

FLASH IN THE TANK. Aircraft owners and mechanics are cautioned that when wing tip strobe wiring is routed through fuel tanks the system must receive careful inspection and maintenance. Several wing tip explosions have occurred when fuel vapors were ignited by malfunctioning strobe lights mounted in tip tank structures. In some cases conduit, which carries the wiring through the fuel tank, was damaged by fuel hose nozzles during refueling. A new FAA Advisory Circular encourages operators of aircraft with wingtip strobes to see that the system is inspected for deficiencies (use explosion-proof flashlight only). Maintenance and fueling personnel should keep the problem in mind during servicing and maintenance. Note: whenever "clicks" are heard in the radio coinciding with the strobe flashes, a mechanic should be consulted for possible shielding breaks. "Strobe Light System Inspection Practices" (AC 90-75) is free.

BLINKING LIGHTS. If temporary obstruction lighting is needed during construction, it is now permissable to use white strobe lights and/or battery operated lights. This is one of the revisions in FAA's updated advisory circular on obstruction lighting and marking. Another change is the inclusion of metric units in addition to customary U.S. units of measure. AC 70/7460-1E, "Obstruction Marking and Lighting" is free.

SINGLE BELTED OR DOUBLE-BELTED? Aircraft owners intent on replacing safety belts are cautioned to be sure they order—and receive— the proper type for their particular needs. Technical Standard Order (TSO) approved safety belts are designed for either single occupancy or double occupancy, but this information may not be marked on the belts themselves. The way to tell is to look at the "rated strength", which must appear on the label. If the rated strength is 1,500 pounds the belt is designed for single occupancy; if it is 3,000 pounds or more, the belt can serve two people. (Back seats of some aircraft use a single belt to restrain both passengers). Replacement of safety belts is considered "preventive maintenance" which pilots are permitted to do on their own airplanes.

THE LAST WORD. A 60-day suspension of an airline pilot's license by FAA for disobeying a controller's instructions, and then arguing about it over the radio, was upheld by the National Transportation Safety Board following an appeal by the pilot. According to the NTSB docket the B-727 pilot who was landing at Chicago's O'Hare Airport refused to reduce his speed from 200 to 180 knots as instructed, and refused to accept a clearance that would have taken him out of the landing sequence. NTSB declared the speed reduction request "reasonable" and the pilot's refusal to comply "unreasonable". Worse yet, said NTSB, the continuing dispute prevented the controller from giving the appropriate attention to other aircraft.

Advisory Circulars mentioned in this column, unless otherwise noted,are available free from DOT/FAA Publications Section, TAD-443.1, Washington, D.C. 20590.

A HALF-CENTURY has passed since Charles A. Lindbergh, the "Lone Eagle," made his famous solo flight across the Atlantic from New York to Paris on May 20, 1927. This yearmembers of the Experimental Aircraft Association plan to fly a home-built replica of Lindbergh's airplane, "Spirit of St. Louis" (shown above during construction) around the country, recreating the triumphal three-month tour that Lindbergh made after his New York to Paris flight.

In St. Louis, where Lindbergh obtained financial backing for his flight, a weekend celebration will include an airshow and fireworks display on the riverfront and a banquet, where the first "Annual Spirit of St. Louis Aviation Award" will be presented to a contemporary American whose life and career have significantly contributed to the advancement of flight.

Aviation Review Meeting Rescheduled from May

The Ninth Annual FAA Aviation Review Conference, previously announced for May 16-18 in Arlington, Va., has been postponed for at least three months. The Secretary of Transportation requested the delay to allow time for the new administration's policies and programs to be properly addressed.

As soon as a new date has been scheduled, an announcement will be made in this magazine, and those on the FAA consultative mailing list will automatically be notified. Those who desire to be placed on this list, and who have not previously so requested, should send name and address to:

Office of Aviation System Plans
FAA, ASP-10
800 Independence Ave. SW
Washington, D. C. 20591

TERPS Available From GPO

The United States Standard for Terminal Instrument Procedures—better known as TERPs—is now sold by GPO. This publication is used by FAA personnel in designing terminal instrument procedures.

Copies of TERPs can be ordered by sending a check or money order for $2.80 (add 70 cents for foreign mailing) to Superintendent of Documents, U.S. Government Printing Office, Washington, D.C. 20402. Ask for "United States Standard for Terminal Instrument Procedures (TERPs)," FAA Handbook 8260.3B, Dated July 1976, Stock #050-007-00345-5. (No COD orders.)

Aircraft Type Data Sheets Now Offered in Six Volumes

A new system for production and sales of Type Certificate Data Sheets and Specifications for aircraft, engines and propellers is being introduced by FAA this month. Under the new arrangement the above documents will be separated into six volumes, according to aircraft weight and configuration, rather than a single large volume for aircraft data and another for propellers and engines, as was previously the case.

New volume titles, stock numbers, and prices are:

Volume I—Single-Engine Airplanes (regardless of weight), TCDS1. $38.00 ($47.50 Foreign)

Volume II—Small Multiengine Airplanes (12,500 pounds or less), TCDS2. $28.00 ($35.00 Foreign)

Volume III—Large Multiengine Airplanes (more than 12,500 pounds), TCDS3. $32.00 ($40.00 Foreign)

Volume IV—Rotorcraft, Gliders and Balloons, TCDS4. $16.50 ($20.75 Foreign)

Volume V—Aircraft Engines and Propellers (all types and models), TCDS5. $27.00 ($33.75 Foreign)

Volume VI—Aircraft Listing and Aircraft Engine and Propeller Listing (information pertaining to older aircraft, engines and propellers). (S/N 050-007-00360-9) $4.15 ($5.20 Foreign). Note: order this item separately.

Order from Superintendent of Documents, U.S. Government Printing Office, Washington, D.C. 20402.

Nominations Sought for Annual Instructor and Mechanic Awards

Applicants are being sought for the 1977 "Flight Instructor of the Year" and "General Aviation Mechanic of the Year" awards, which are this year for the first time being conducted by aviation industry, with FAA support at regional and national levels. Both awards will be presented in Washington, D.C. on June 28 in a joint ceremony.

Under current procedures, individual mechanics and flight instructors may nominate themselves. Nomination blanks with complete instructions are being sent to all mechanics and flight instructors of record. Deadline for returning the forms (which are to be sent directly to the governing committee, *not to FAA*) is May 15.

Additional forms are available as follows: *Mechanic of the Year:* Irving Birnbaum, Aviation Maintenance Foundation, Inc., 203 Oxford St., Chevy Chase, Md. 20015. *Flight Instructor of the Year:* Ms. Jean Scheerer, National Association of Flight Instructors, Box 20204, Columbus, Ohio 43220.

Tips on Extending Tire Life

The use of 100 percent nitrogen gas to inflate aircraft tires is one of the major recommendations of a recent FAA study on means of lengthening tire and wheel serviceability. Corrosion of the wheel and oxidation of the rubber, which occurs when ambient air (20 percent oxygen) is used, is avoided with nitrogen, an inert gas.

The research results also emphasized the importance of maintaining recommended tire pressure levels as a means of reducing external wear. A daily pressure check, as part of the preflight examination, was recommended, using an instrument that will give a precise, dependable reading. Because of the nature of aircraft tire usage, a few pounds of pressure above or below the proper level has a noticeable effect on wear and structural failure.

The study report, "High-Speed Tire Maintenance and Operational Practices" (AC 20-97), is available free from the DOT/FAA Distribution Unit, TAD 443.1, Washington, D.C. 20590.

• Fire Extinguishers

I am a recently certified pilot and sincerely appreciate the informative and interesting FAA General Aviation News. I would like to call your attention to some facts about fire extinguishers, which were mentioned in an article entitled "Out In the Cold" in the November/December issue.

Carbon tetrachloride fire extinguishers although very effective for electrical fires, are now banned in the United States and many other places because of toxic gases released in the pyrolized state (fire conditions). Most notable and least immediately detectable is phosgene gas, which can be very hazardous in closed areas (such as cockpits).

Secondly, winterization is not necessary for carbon dioxide (CO_2) fire extinguishers, since CO_2 used as a fire extinguishing agent is liquid dry ice and is not subject to either freezing or sufficient pressure reduction to cause failure down to −40 degrees F. All U.I. listed and properly maintained CO_2 extinguishers have an effective temperature range of −40 degrees to 120 degrees F.

Roger S. Beeson
Newark, Del.

• Paid in Kind

When I hear complaints about TCA's transponders and reporting altimeters I think of a flight around Labor Day in 1975. I called Las Vegas Approach Control from 20 miles out and told them I would be overflying their TCA at 9,500 feet. I was not required to make this report—visibility was about 100 miles and the top of the TCA is 9,000 feet—but I felt more comfortable after the controller gave me a new transponder code and announced "radar contact."

Just after we passed the VOR an airline jet departed Las Vegas and was advised by the controller that we were "12 o'clock, ten miles, northwest bound at 9500 feet" and the jet pilot said he was "looking." Then we were announced at 12 o'clock seven miles, then five, then three. Each time the airline acknowledged, "We're still looking." When they hadn't seen us at two miles distance the airline pilot decided to level at 9000 until clear of traffic. Shortly afterward he advised he had us in sight and a few seconds later the jet passed by our right wing tip with the nose pointed toward FL 300.

Our transponder and reporting altimeter paid for themselves in those few moments. I would like to compliment that controller and those two conscientious airline pilots—even though they did not see known traffic at two miles in unlimited visibility!

Clarence Brock
San Dimas, Calif.

• Reviving Dead Batteries

In your November/December 1976 issue you suggest in the article on winter maintenance ("Out in the Cold") that a booster charge or even a generator can revive a battery when all the cells are dead. I suggest that when something is actually dead it is beyond reviving.

Kensington, Md.

No question about it. The expression, "dead cell," is sometimes used loosely, and incorrectly as it was in this case, to mean "fully discharged." The line in question should have read, "If all the cells are fully discharged, and you have an alternator, only a booster charge can excite the alternator sufficiently so that the latter can recharge the battery."

A "dead battery," strictly speaking, is one no longer capable of sustaining a charge.

• From a Horse's Mouth

The accident investigation articles you write are interesting, make their point, but how about letting us hear it directly from the pilots involved once in a while? We might all get a new slant on what's going on if you printed a pilot's eye view of what took place when the fan stopped turning. Especially if you offered to keep our names out of it.

Ann Ahnimus
Erehwon

Agreed. We would like to have anyone who has had an interesting aviation experience send us his account of it, and permission to print. Incidentally, we have published such narratives on several previous occasions, and solicited others. See, for example, "Rise Up With Wings As Eagles" in the October 1975 issue.

• Souls on Board

As a Flying Funeral Director I regularly transport human remains from one place to another. One question that bothers me apparently cannot be answered by any of the specialists at the flight service stations I have been to, so please help. How do I list the number on board on a flight plan? Do I use the total head count, or do I list non-living bodies under remarks?

David C. Heath
Champaign, Ill.

Under remarks. Non-living bodies are considered cargo, but in case of accident it will avoid confusion for search and rescue personnel to know the facts.

• Airport Traffic Zone?

Your article "Occupied Airspace" in the October 1976 issue states in part ". . . to assume that once they have departed the airport traffic zone. . . ." I am sure you mean "airport traffic area," right?

A. R. Boileau
San Diego, Calif.

"Airport traffic area" is correct.

• Fore and Aft Wheels

All kidding aside, the DC-8, during the certification at Edwards Air Force Base some 16 years ago, did have a tail wheel. A small boom with a set of steel roller wheel was used under the tail on certain test flights to determine maximum nose-up attitude during takeoff runs. This was, of course, in addition to the "conventional" nose wheel.

C. M. ("Marty") Lauridsen
Long Beach, Calif.

FAA GENERAL AVIATION NEWS welcomes comments from our readers. No anonymous letters will be used, but names will be withheld on request. Address: FAA GENERAL AVIATION NEWS, AFS-807, Washington, D.C. 20591.

• IFR or IMC?

Your Flight Forum answer to "More on VOR Checks" in your June issue is a step backword in antiquidated (sic) terms and ambiguous meanings when you refer to "IFR conditions." Brushing nostalgia aside, I believe proper terminology should be "IMC."

Philip S. Le
APO N.Y.

The Federal Aviation Regulations Part 1 (Definitions) states: "IFR conditions means weather conditions below the minimum for flight under visual flight rules"—which is exactly the condition we were describing in the earlier forum reply. We are aware that in some quarters "IMC" (instrument meteorological conditions) is being used synonymously.

• Help for Amateurs

I am interested in building my own aircraft. Your article on the subject, "School-built Airplanes," July 1976, was more than interesting. Can you please tell me what advisory circulars are available.

John McHugh
Arlington Hts., Ill.

"Certification and Operation of Amateur Built Aircraft," AC 20-27B, explains FAA's role in certificating such aircraft and the pilots who fly them. "Aviation Education Through Building an Airplane," AC 20-86, lists the location of Flight Standards field offices which can be helpful to anyone who wants to build an airplane.

Both advisory circulars are available free from the DOT/FAA Distribution Unit, TAD 443.1, Washington, DC 20590.

INSTRUMENT CORNER

• Side-step

I recently heard a controller issue an approach clearance with a "side-step." Can you explain this term?

J. C. McDonald
Pittsburgh, Pa.

A side-step maneuver is one where an aircraft executes a specified approach to a given runway, then moves over to land on a parallel runway after he has the runway or runway environment in sight. A typical clearance would read "Cleared for ILS runway seven left approach, side-step to runway seven right."

The side-step will only be used where there are parallel runways no more than 1,200 feet apart. In this kind of approach landing minima to the adjacent parallel runway is higher than the minima to the primary runway but will generally be lower than for a circling approach. (This maneuver, incidentally, is described in AIM, Part 1)

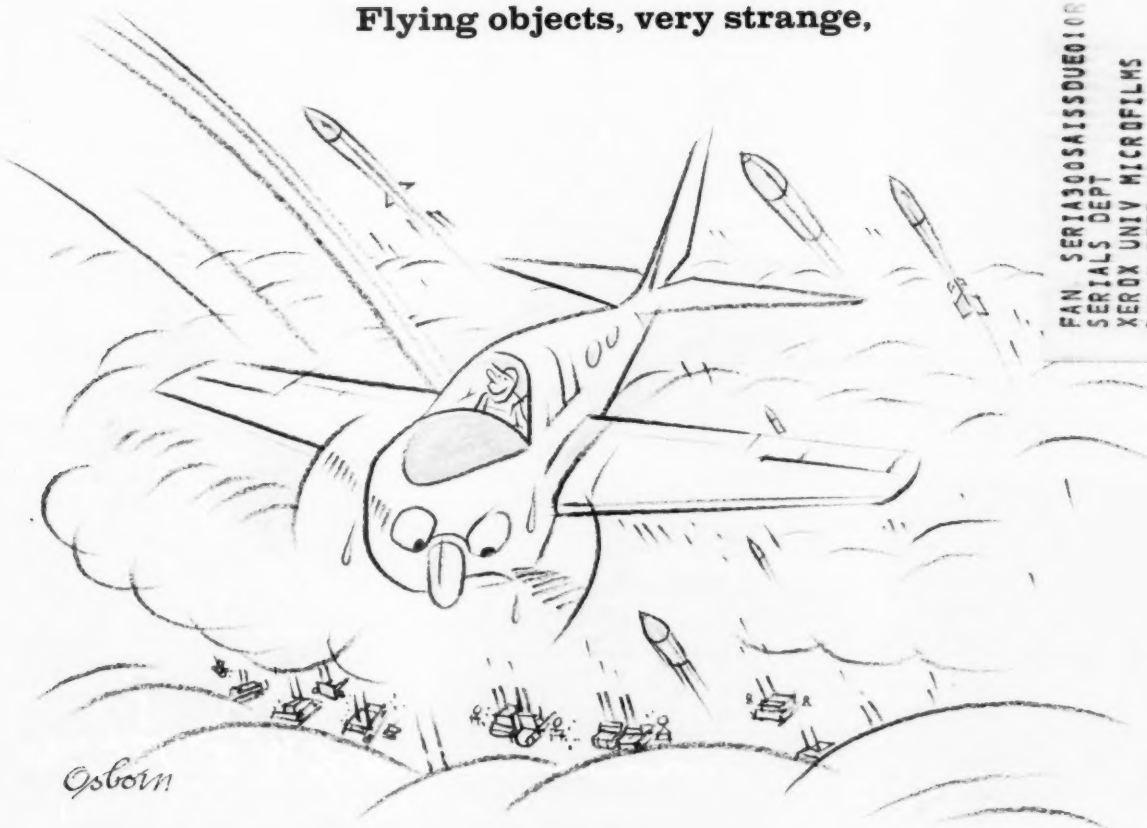
•U.S. GOVERNMENT PRINTING OFFICE: 1977 240-910/2 1-3

U.S. GOVERNMENT PRINTING OFFICE
DIVISION OF PUBLIC DOCUMENTS
WASHINGTON, D.C. 20402
OFFICIAL BUSINESS
RETURN AFTER 5 DAYS

Postage and Fees Paid
Federal Aviation Administration
Third class
DOT 515

FAN SER1A300SA1SSDUE01OR
SERIALS DEPT
XEROX UNIV MICROFILMS
300 N ZEEB RD
ANN ARBOR MI 48106

Flying objects, very strange,



Populate a missile range